

REMARKS

I. Introduction

In response to the Office Action dated November 17, 2005, Applicants have amended claims 7, 8, and 10 to more particularly point out and distinctly claim the subject matter of the invention. Additionally, new claims 11 – 14 have been added. Support for these amendments may be found, for example, in the specification at pages 7, 10, 11, 14, and 15, and in figures 8 and 13. No new matter has been added.

In view of the foregoing amendments and the following remarks, Applicants respectfully submit that all pending claims are in condition for allowance.

II. Claim Objections

The Examiner has objected to claim 10 for the minor informality of using the term “having” in line 1 of the claims. Applicants have amended claim 10 to replace the term “having” with the term “has”. Accordingly, Applicants request that this objection be withdrawn.

III. Claim Rejections Under 35 U.S.C. § 103

Claims 7, 8, 10, and 11 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent Publication No. 2002/0158311 to Ohnishi in view of U.S. Patent No. 6,830,982 to Howard. Claim 9 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ohnishi and Howard, and further in view of U.S. Patent No. 6,586,818 to Voldman. Applicants traverse these rejections for at least the following reasons.

Claim 7, as amended, recites forming an insulating film having an emitter opening portion on a third semiconductor layer, wherein the insulating film is in contact with the upper

surface of the third semiconductor layer and implanting ions into the second and third semiconductor layers from a direction tilted from a perpendicular direction with respect to a surface of a substrate. At least these feature are not taught or suggested by the combination of Ohnishi and Howard, as alleged by the Examiner.

Ohnishi appears to disclose a semiconductor device having multiple semiconductor layers. The Examiner equates layers 101, 111b, and 111a, with the first, second, and third semiconductor layers recited in claim 7. Even if these layers could be considered equivalent to the semiconductor layers recited in claim 7, Ohnishi also discloses, as an external base layer, P+ polysilicon layer 115 between the Si/SiGe layer 111 and the insulating film 117. Accordingly, the insulating film 117 is not in contact with the upper surface of the Si/SiGe layer 111. Thus, Ohnishi fails to disclose or suggest the insulating film in contact with the upper surface of the third semiconductor layer.

The Examiner acknowledges that Ohnishi fails to disclose implanting ions into the second and third semiconductor layers from a direction tilted from a perpendicular direction with respect to a substrate, and relies on Howard to overcome this deficiency. However, if even Howard does disclose this feature, there is no motivation to combine the teachings of Ohnishi and Howard.

Howard appears to disclose a method of forming an external base layer wherein P-type impurity ions are implanted at an angle that is less than 90 degrees relative to the surface of the wafer (a non-zero tilt). Ohnishi depicts, for example in Figure 9(a), that a boron implantation to form the external base region is performed all over the polysilicon film 117. Accordingly, there is no motivation to adopt the non-zero tilt method disclosed by Howard. In fact, if Ohnishi were to adopt the non-zero tilt method of implanting ions, the result would be an increase in the

number of ion implantations from once to four times. A person skilled in the art would not consider the non-zero tilt ion implantation as a preferable method. As such, there is no motivation to combine the teachings of Ohnishi and the teachings of Howard.

As it is well known that every claim element must be disclosed or suggested by the prior art in order to establish a *prima facie* case of obviousness (*see, e.g.*, MPEP § 2143.03) and as the cited prior art references fail to do so, Applicants respectfully submit that claim 7 is patentable over the cited references. Further, the Examiner is directed to MPEP § 2143.01 under the subsection entitled "Fact that References Can Be Combined or Modified is Not Sufficient to Establish *Prima Facie* Obviousness", which sets forth the applicable standard:

A statement that modifications of the prior art to meet the claimed invention would have been [obvious] because the references relied upon teach that all aspects of the claimed invention were *individually* known in the art is *not* sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. (citing *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993)).

In the instant case, even assuming *arguendo* that Ohnisha view of Howard "teach that all aspects of the claimed invention [are] individually known in the art", it is submitted that such a conclusion "is not sufficient to establish a *prima facie* case of obviousness" because there is no *objective* reason on the record to combine the teachings of the cited prior art in the manner attempted by the Examiner.

Claims 8 - 11 depend from claim 7. New claims 12 - 14 also depend from claim 7 and recite additional features. Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claim 7

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is patentable for the reasons set forth above, it is respectfully submitted that all remaining dependent claims are also in condition for allowance.

IV. Conclusion

Accordingly, it is urged that the application is in condition for allowance, an indication of which is respectfully solicited.

If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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